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10/759,480	01/16/2004	Jaiganesh Balakrishnan	TI-35863	7576

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EXAMINER	
WANG, TED M	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
09/20/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/759,480	BALAKRISHNAN ET AL.	
	Examiner	Art Unit	
	Ted M. Wang	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-19 and 27-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-19* is/are allowed.

6)☒ Claim(s) *1-3,5,6,8,9 and 27-32* is/are rejected.

7)☒ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The indicated allowability of claims 1-3, 5-9 and 27-32 are withdrawn in view of the newly discovered reference(s) to US 6,763,057 and US 6,700,939. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 5, 6 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al. (US 6,763,057) in view of McCorkle et al. (US 6,700,939).

- With regard claim 1, Fullerton et al. discloses an ultra-wideband receiver comprising:

  a filter coupled to a signal input, the filter to pass signals in a frequency band from a received signal provided by the signal input (column 4 lines 58-60)

  an amplifier, the amplifier to bring the passed signals to a signal level compatible with circuitry in the receiver (Fig.27a element 18);

demodulating unit coupled to the amplifier, the demodulating unit containing circuitry to bring the passed signals to an internal frequency (Fig.27a element 21);

a timing generating unit (Fig.27a element 22) coupled to the demodulating unit, the timing generating unit containing circuitry to generate samples of the passed signals at different timing offsets (Fig.10 elements 22, 24, 25 and elements 31, 22, 24, 25, where the I channel is the early channel and J channel is the delayed channel (column 10 lines 63-66)),

wherein the timing generating unit comprises a pair of sample/hold circuits having inputs coupled to the demodulating unit (Fig.27a element 25), and

a converter coupled to the timing generating unit, the converter to convert continuous samples produced by the timing generating unit into discrete samples (Fig.27b elements 32 and 33).

Fullerton et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching wherein a first sample/hold circuit produces an on-time sample and a second sample/hold circuit produces an early and a late sample.

However, McCorkle et al. teaches wherein a first sample/hold circuit produces an on-time sample and a second sample/hold circuit produces an early and a late sample (Fig.29A, elements delay lines, L (on-time), L-Y (early), L+Y (late)). It is desired to use line lengths of L+Y, L-Y, and L, to form

lead, lag and on-time signals for the DLL. These line length differences lead to time delays that, during acquisition, are selected to place the on-time signal at the maximum of the pulse code autocorrelation function, and the lead and lag terms symmetrically before and after it (column 13 lines 1-6) so that the communication quality can be improved. Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the delay lines L+Y and L-Y, and L as taught by McCorkle et al. into sample/hold circuit (element 25) of the Fullerton so as to improve the communication quality.

- With regard claim 2, Fullerton et al. further discloses wherein the demodulating unit further contains circuitry to provide in-phase and quadrature phase signal streams from the passed signals (Fig.27a element 21 output).
- With regard claim 3, Fullerton et al. further discloses wherein the demodulating unit further contains amplifiers to variably adjust the gain of the in-phase and quadrature phase signal streams (column 16 lines 43-55).
- With regard claim 5, Fullerton et al. further discloses wherein the timing generating unit comprises a pair of sample/hold circuits for each signal stream (Fig.27a element 25).
- With regard claim 6, the modified circuit of Fullerton et al. and McCorkle et al. further discloses wherein the converter comprises a pair of analog-to-digital converters (ADC) (Fig.27b elements 32 and 33), wherein a first ADC converts

the on-time samples and a second ADC converts the early and late samples (Fig.27b elements 32 and 33).

- With regard claim 27, Fullerton further discloses a transmitter (Fig.22) comprising:

an encoding unit coupled to a data source, the encoding unit containing circuitry to apply a code to data provided by the data source (Fig.22 elements 26);

a spreading unit coupled to the encoding unit, the spreading unit containing circuitry to apply a spreading code to the data (Fig.22 elements 24);

a pulse shaping unit coupled to the spreading unit, the pulse shaping unit containing circuitry to apply mask of a desired pulse with desired frequency characteristics to the encoded and spread data (column 8 lines 19-43);

a modulating unit coupled to the pulse shaping unit, the modulating unit to apply a carrier frequency to the shaped, encoded, and spread data (Fig.22 element 16); and

a filter coupled to the modulating unit, the filter to ensure that the modulated, shaped, encoded, and spread data fit within a desired frequency range (Fig.1b element 622 and column 8 lines 34-51).

Fullerton further discloses an antenna for transmitting signals and an antenna for receive signals (Fig.22 element 20 and Fig.27a element 17).

The modified circuit of Fullerton et al. and McCorkle et al. as described in the above paragraph discloses all of the subject matter as described in the above paragraph except for specifically teaching a switch coupled to the antenna, the switch to control access to the antenna.

However, McCorkle et al. teaches an antenna for transmitting and receiving input signals (Fig.9 element antenna port and column 12 lines 26-42) and a switch coupled to the antenna, the switch to control access to the antenna (Fig.9 elements 904, 908 and 914 and column 12 lines 26-42).

FIG. 9 of McCorkle shows an embodiment for switching a common antenna between the transmitter and the receiver, and sharing the same dispersive analog code hardware, even when the dispersive analog code construction is directional (column 12 lines 26-42). This feature is important when amplifiers are buried in the structure of the programmable dispersive-analog-code in order to reduce the cost. Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the antenna switch circuit as taught by McCorkle into the antenna circuit of the modified circuit of Fullerton et al. and McCorkle et al. so as to reduce the cost

4. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al. (US 6,763,057) and McCorkle et al. (US 6,700,939) as applied to claim 1 above, and further in view of Shen et al. (US 5,640,698).

- With regard claim 8, Fullerton et al. and McCorkle et al. disclose all of the subject matter as described in the above paragraph except for specifically teaching a receiver comprising an interference mitigating circuit having an input coupled to the amplifier and an output coupled to the demodulator, the interference mitigating circuit comprising: a down-conversion unit to bring an interference band within the received signal down to baseband; and a high-pass filter coupled to the down-conversion unit, the high-pass filter to eliminate the interference band located at baseband.

  However, Shen et al. discloses a receiver comprising an interference mitigating circuit having an input coupled to the amplifier and an output coupled to the demodulator (column 7 line 66 to column 8 line 18), the interference mitigating circuit comprising:

  a down-conversion unit to bring an interference band within the received signal down to baseband (column 7 line 67 to column 8 line 2); and

  a high-pass filter coupled to the down-conversion unit, the high-pass filter to eliminate the interference band located at baseband (column 8 lines 5-7).

  It is desirable to have the interface mitigating circuit in order to eliminate the interference (column 7 line 67 to column 8 line 2). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the interference mitigating circuit as taught by Shen et al. into

the modified circuit of Fullerton et al. and McCorkle et al. so as to eliminate the interference band.

- With regard claim 9, Neither Fullerton et al. and McCorkle et al. or Shen et al. specifically disclose an interferer located within a frequency band of 5.15 GHz to 5.85 GHz, wherein the mixer carrier frequency is approximately 5.5 GHz, and wherein the high-pass filter has a cutoff frequency at approximately 350 MHz, such limitation is merely a matter of design choice and would have been obvious in the system of Fullerton et al. and McCorkle et al. and Shen et al. Depending on the initial location of the interferer frequency band, the carrier frequency should be chosen so that once mixing is complete, i.e., once the interferer is down-converted, the interfere frequency band is lower than the cutoff frequency of the high-pass filter and, thus, resulting in the mitigation of the interferer.

  Regarding the down-conversion unit being a mixer, Shen et al. disclose a down-conversion unit that is a mixer (column 2, lines 44-51).

5. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al. (US 6,763,057) and McCorkle et al. (US 6,700,939) as applied to claim 27 above, and further in view of Grimwood et al. (US Pub 2001/0033611).

- With regard claim 28, Fullerton et al. and McCorkle et al. disclose all of the subject matter as described in the above paragraph except for specifically

teaching wherein the desired pulse is a square-root raised cosine (SRRC) pulse.

However, Grimwood et al. discloses a device wherein the desired pulse is a square-root raised cosine (SRRC) pulse (paragraph 0238, lines 4-5).

The square root raised cosine filter has a transfer function characteristic suitable to shape the outgoing chip pulses so as to satisfy Nyquist criteria in a known manner so as to provide optimal signal-to-noise enhancement and so as to minimize intersymbol interference (paragraph 239). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the SRRC filter as taught by Grimwood et al. into the transmitted circuit of the modified circuit of Fullerton et al. and McCorkle et al. so as to minimize intersymbol interference.

- With regard claim 29, Grimwood et al. do not specifically disclose the SRRC pulse has a frequency bandwidth that is a fraction of available ultra-wideband bandwidth, however, it is clearly obvious to those of ordinary skill in the art that the pulse bandwidth must be a fraction of available ultra-wideband bandwidth, i.e., must be less than the available ultra-wideband bandwidth. If the pulse bandwidth is greater, interference is then caused by some pulse frequency spilling over onto the unavailable bandwidth.

6. Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al. (US 6,763,057) and McCorkle et al. (US 6,700,939) and Grimwood et

al. (US Pub 2001/0033611) as applied to claim 27 above, and further in view of Roberts (US Pub 2006/0166619).

- With Regard claim 30, Fullerton et al. and McCorkle et al. disclose all of the subject matter as described in the above paragraph except for specifically teaching wherein the device avoids transmitting in frequency bands of known interferers.

  However, Roberts discloses, wherein the device avoids transmitting in frequency bands of known interferers (paragraph 0170, lines 3-8).

  It is essential that a device avoid transmitting in frequency bands of known interferers. It is clearly obvious that transmitting in frequency bands of known interferers results in interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to avoid transmitting in frequency bands of known interferers, as Roberts teaches, in order to prevent signal interference.

- With Regard claim 31, Fullerton et al. and McCorkle et al. disclose all of the subject matter as described in the above paragraph except for specifically teaching wherein the device transmits in the frequency bands of known interferers when they are absent

  However, Roberts further discloses, wherein the device transmits in the frequency bands of known interferers when they are absent (paragraphs 0172 and 0173).

- With Regard claim 32, Fullerton et al. and McCorkle et al. disclose all of the subject matter as described in the above paragraph except for specifically teaching wherein the device transmits in a portion of available ultra-wideband bandwidth, and wherein when multiple ultra-wideband devices are present, each ultra-wideband device can transmit in a different portion of the ultra-wideband bandwidth.

However, Roberts further discloses, wherein the device transmits in a portion of available ultra-wideband bandwidth, and wherein when multiple ultra-wideband devices are present, each ultra-wideband device can transmit in a different portion of the ultra-wideband bandwidth (paragraph 0174, wherein, 'two or more bands' is interpreted as different portions of the ultra-wideband bandwidth).

Allowable Subject Matter

7. Claims 10-19 are allowed.

8. Claim 7 is objected to as being dependent upon an objected claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang
Examiner
Art Unit 2611

Ted M. Wang